Water & Food Edition 27, CPWF Newsletter Aug/Sept 2008

Improving Tropical Hillside Agroecosystems

KNOWLEDGE EXCHANGE

Aracely Castro, CIAT Honduras

To advocate and assist cross-learning between complementary CPWF projects, in August 2007 CPWF Theme 1 (Crop Water Productivity Improvement) announced the availability of funds for travel grants to Theme 1 project members. CPWF Project 15 'Quesungual slash and mulch agroforestry system: Improving crop water productivity, food security and resource quality in the sub-humid tropics' application to visit CPWF Project 11 'Rice landscape management for raising water productivity, conserving resources and improving livelihoods in upper catchments of the Mekong and Red river basins' was approved, and executed in February 2008. The following story discusses the possibility of validating a successful agroforestry system developed by Latin-American farmers and technicians, with small-scale farmers of South-east Asia uplands.

Combating deforestation

Slash and burn (SB) is an ancient form of agriculture practiced in around 25 per cent of the tropical land area. Even though SB agriculture does not guarantee food security and is recognized as a non-sustainable, environmentally unfriendly practice, farmers persist on using it for the short-term benefits it provides. SB practice continues to be the cheapest immediate source of firewood for householders and of nutrients for crop development, and an efficient method to control the incidence of pests and diseases on major staples.

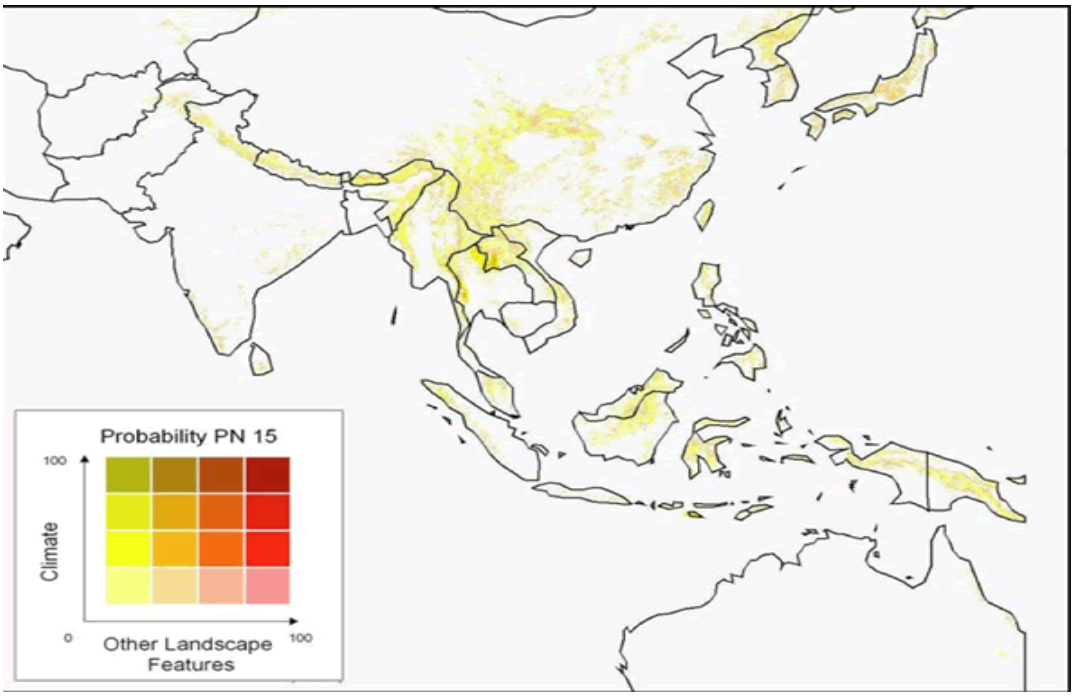
Combating deforestation and land degradation to mitigate the negative effects of agriculture on the environment are some of the major forces driving governments to outlaw SB. This may be perceived as the easiest route to impede slash and burn practices, but it certainly not the most effective. Resource-poor farmers simply need to produce food to subsist, and **unless they have access to feasible agricultural alternatives, they are unlikely to stop burning**. Unfortunately, there are few ready alternatives to SB practice, especially for small-scale farmers forced to produce on marginal lands in the tropics.

In Honduras, an indigenous production system known as 'Quesungual' was identified by environmental technicians and then improved in collaboration with local farmers. **CPWF Project 15's** Quesungual Slash and Mulch Agroforestry System (QSMAS) is a smallholder production system with a group of technologies for the sustainable management of water, soil and nutrient resources in drought-prone areas of hillsides agroecosystems of the sub-humid tropics. Farmers and development organizations had reported that in the short term QSMAS might be as productive and profitable as the SB system.

In contrast to systems based on SB practice, the **QSMAS principles of 1) no SB, 2) permanent soil cover, 3) minimal disturbance of soil, and 4) efficient use of fertilizer, contribute to improved food security, livelihoods and natural resources management** through water efficient, soil conserving technologies. In the last decade, QSMAS has been promoted and successfully disseminated between resource-poor farmers in southwest Honduras as an alternative to replace the SB traditional production system.

Alternatives for hillside agroecosystems

Among the specific objectives of CPWF 15 is to evaluate and document potential areas in the tropics that are suitable to QSMAS. Testing of QSMAS as an alternative to SB system through validation work with farmers in Nicaragua and Colombia has yielded significant results beyond expectations due to high acceptance of QSMAS by farmers and local authorities. Due to its good agronomic performance, in terms of productivity, the system successfully spread beyond the validation sites in Nicaragua. Site similarity analysis (SSA), used to define extrapolation domains for QSMAS, had identified other tropical regions with possibilities for its adaptation, including Southeast Asia (SE Asia) around the catchments of Mekong River in Thailand, Laos, Myanmar, Vietnam and China.



Preliminary extrapolation domains in Southeast Asia for the Quesungual Slash and Mulch Agroforestry System (QSMAS).

Both CPWF 15 and CPWF 11, the 'Rice landscape management for raising water productivity, conserving resources and improving livelihoods in upper catchments of the Mekong and Red river basins' project, are addressing similar research for development issues in their respective target areas. Both projects work with small-scale farmers facing similar problems that are limiting productivity and sustainability (*e.g.* soil erosion, poor sustainability and reduced crop-water productivity) in hillside areas with steep slopes where SB is the predominant production system.

Cross-project collaboration

Given the similar contexts and the probabilities for QSMAS adaptation to SE Asia according to the SSA, a visit to the target region of **CPWF Project 11** in Vietnam and Lao PDR was organized with the following objectives to:

- Exchange information on the management practices used by farmers in the production systems located in steep slopes
- Become familiar with the technologies being promoted by CPWF 11 for their potential targeting to similar areas of Latin America, and
- Share CPWF 15 knowledge and experience on QSMAS with CPWF 11 staff and partners, with a view to conduct a preliminary assessment of the suitability of QSMAS as an alternative to SB system in the uplands of SE Asia.

Aracely Castro, a Visiting Researcher of CIAT and also a QSMAS project PhD student, visited Lao PDR and Vietnam. Visits to CPWF 11 field sites in company of project staff and partners provided **unique opportunities for the exchange of knowledge**

and resulted in a better understanding of the biophysical, socioeconomic and political contexts in the target region, and the knowledge of the technologies being tested and/or promoted by the Rice Landscape Management project.

For CPWF 15, the main product of this visit is the knowledge of paddy rice production in both, uplands and lowlands, as an option to increase rice production in rural areas of Mesoamerica. In a second phase, technologies being promoted by CPWF 11 can be explored as opportunities for crop diversification and improved linkages to markets extend the benefits of QSMAS in Mesoamerica. For both projects, the main future objective could be the validation of QSMAS (or its principles) as a suitable alternative to SB system to improve food security and sustainability in the face of climate risks and land degradation in uplands of Lao PDR and Vietnam.

Expected outcomes from this common objective could be contributing towards national objectives of protecting ecosystem services and local possibilities for the incipient policies on payment for environmental services that are being promoted in these countries.

There is a need for a more rigorous feasibility study to explore the potential of QSMAS in sloping lands of SE Asia before initiating any efforts for its validation and adaptation. The study could include:

- Conducting a specific SSA to contrast conditions in the reference (and maybe validation) site/s with those in north Lao PDR and Vietnam
- Documenting and analyzing key information on agricultural issues and also the characteristics of secondary forests, and
- Determining the potential for acceptance and support to QSMAS by local farmers and also technical and administrative authorities for scaling out and scaling up of the system.

Lowland paddies and upland fields for production of rice, maize and cassaya. Nam Bung, Yen Bai province, Vietnam.

The author wishes to express her gratitude to Theme 1 Staff Dr. Elizabeth Humphreys and Ms. Ruvicyn Bayot, Project 15 Leader Dr. Idupulapati Rao and Project 11 Staff Drs. Sushil Pandey, Benjamin Sampson and Damien Jourdain for their support for realizing the field visits and for their comments on the trip report.
